

What is claimed is:

1. An active matrix type liquid crystal display device having a structure in which a pixel TFT is disposed in a trench carved in a substrate; wherein

with a section which is not carved in but left hill-shaped
5 being present in the vicinity of the TFT, an underneath
light-shielding film disposed beneath a semiconductor layer of the
TFT is formed so as to reach at least the top of said hill-shaped
section; and a metal electrode layer formed above the semiconductor
layer of the TFT extends to the top of said hill-shaped section;
10 and besides, on the top of said hill-shaped section, a film thickness
of an interlayer insulating film laid between said underneath
light-shielding film and metal electrode layer is made thinner than
in other sections thereof.

2. A liquid crystal display device according to Claim 1; wherein the interlayer insulating film laid between said underneath light-shielding film and metal electrode layer comprises a first interlayer film formed between the underneath
5 light-shielding film and the semiconductor layer as well as a gate
insulating film formed between the semiconductor layer and the metal
electrode layer; and, on the top of said hill-shaped section, at
least a part of said first interlayer film in the direction of the
thickness is etched away.

3. A liquid crystal display device according to Claim

2, wherein, after said first interlayer film is removed to expose the light-shielding metal film on the top of said hill-shaped section, a second interlayer film which is thinner than said first interlayer 5 film is formed, and thereafter the gate insulating film is formed.

4. A liquid crystal display device according to Claim 1, wherein said hill-shaped section is formed so as to enclose the TFT.

5. A liquid crystal display device according to Claim 1, wherein said hill-shaped section is formed on either side of a region where the semiconductor layer of the TFT is formed in the direction parallel to a gate line so that said region may become 5 groove-shaped.

6. A liquid crystal display device according to Claim 4, wherein a portion of said semiconductor layer of the TFT constitutes a storage capacitor section and the interlayer film laid between the semiconductor layer and the underneath 5 light-shielding film in said storage capacitor section is made thinner than in the TFT section.

7. A liquid crystal display device according to Claim 5, wherein a portion of said semiconductor layer of the TFT constitutes a storage capacitor section and the interlayer film laid between the semiconductor layer and the underneath light-shielding film

5 in said storage capacitor section is made thinner than in the TFT section.

8. A manufacturing method of an active matrix type liquid crystal display device having a structure in which a pixel TFT is disposed in a trench carved in a substrate; which comprises the steps of:

5 growing an underlying insulating film on a transparent insulating substrate;

forming a trench for disposing a pixel TFT by etching said underlying insulating film;

10 forming an underneath light-shielding film on an inner wall of said trench;

forming on the entire surface of the substrate, a first interlayer film to cover said underneath light-shielding film;

forming a semiconductor layer in said trench; and

15 forming a gate insulating film and then a metal electrode layer on said semiconductor layer; wherein

in forming said trench, a section which is not carved in but left hill-shaped is formed in the vicinity of the TFT, and the underneath light-shielding film disposed beneath the semiconductor layer of the TFT is formed so as to reach at least the top of said 20 hill-shaped section; and the metal electrode layer formed above the semiconductor layer of the TFT extends to the top of said hill-shaped section; and which further comprises the step of:

etching away, in the direction of the film thickness, at

least a part of an interlayer insulating film laid between said
25 underneath light-shielding film and metal electrode layer so as
to make a film thickness of the interlayer insulating film on the
top of said hill-shaped section thinner than in other sections.

9. A manufacturing method according to Claim 8, wherein,
after the first interlayer film on the top of said hill-shaped section
is removed to expose the underneath light-shielding metal film,
a second interlayer film which is thinner than said first interlayer
5 film is formed over the entire surface, and thereafter the
semiconductor layer is formed on said second interlayer film.

10. A manufacturing method according to Claim 8, wherein
said hill-shaped section is formed so as to enclose the TFT.

11. A manufacturing method according to Claim 9, wherein
said hill-shaped section is formed so as to enclose the TFT.

12. A manufacturing method according to Claim 8, wherein
said hill-shaped section is formed on either side of a region where
the semiconductor layer of the TFT is formed in the direction parallel
to a gate line so that said region may become groove-shaped.

13. A manufacturing method according to Claim 9, wherein
said hill-shaped section is formed on either side of a region where
the semiconductor layer of the TFT is formed in the direction parallel

to a gate line so that said region may become groove-shaped.

14. A manufacturing method according to Claim 10,
wherein a portion of said semiconductor layer of the TFT constitute
a storage capacitor section, which further comprises the step of
making, in the direction of the film thickness, at least a part
5 of the first interlayer film which is included in an interlayer
film laid between the semiconductor layer and the underneath
light-shielding film in said storage capacitor section thinner than
in the TFT section.

15. A manufacturing method according to Claim 11,
wherein a portion of said semiconductor layer of the TFT constitute
a storage capacitor section, which further comprises the step of
making, in the direction of the film thickness, at least a part
5 of the first interlayer film which is included in an interlayer
film laid between the semiconductor layer and the underneath
light-shielding film in said storage capacitor section thinner than
in the TFT section.

16. A manufacturing method according to Claim 12,
wherein a portion of said semiconductor layer of the TFT constitute
a storage capacitor section, which further comprises the step of
making, in the direction of the film thickness, at least a part
5 of the first interlayer film which is included in an interlayer
film laid between the semiconductor layer and the underneath

light-shielding film in said storage capacitor section thinner than in the TFT section.

17. A manufacturing method according to Claim 13, wherein a portion of said semiconductor layer of the TFT constitute a storage capacitor section, which further comprises the step of making, in the direction of the film thickness, at least a part 5 of the first interlayer film which is included in an interlayer film laid between the semiconductor layer and the underneath light-shielding film in said storage capacitor section thinner than in the TFT section.

18. A manufacturing method according to Claim 14, wherein the step of making the first interlayer film in said storage capacitor section is carried out concurrently with etching of the top of said hill-shaped section.

19. A manufacturing method according to Claim 15, wherein the step of making the first interlayer film in said storage capacitor section is carried out concurrently with etching of the top of said hill-shaped section.

20. A manufacturing method according to Claim 16, wherein the step of making the first interlayer film in said storage capacitor section is carried out concurrently with etching of the top of said hill-shaped section.

21. A manufacturing method according to Claim 17, wherein the step of making the first interlayer film in said storage capacitor section is carried out concurrently with etching of the top of said hill-shaped section.